

## IN THE CLAIMS

**Please amend the claims as follows:**

1. (previously presented) A material for detecting ionizing radiation, comprising a solid organic semiconducting material consisting essentially of a  $\pi$ -conjugated material having an electrical resistivity of at least  $10^9$  ohm-cm.
2. (original) The material of claim 1, wherein the  $\pi$ -conjugated material comprises a mixture of  $\pi$ -conjugated materials.
3. (previously presented) The material of claim 1, wherein the  $\pi$ -conjugated material includes  $\pi$ -conjugated polymers having long chains of alternating single and double carbon-carbon bonds, polyaromatic hydrocarbons, or quinolates.
4. (canceled)
5. (previously presented) The material of claim 3, wherein the  $\pi$ -conjugated polymers are selected from the group of polymers consisting of polyacetylenes, polypyrroles, polyfluorines, and derivatives and combinations thereof.
6. (previously presented) The material of claim 5, wherein the derivative  $\pi$ -conjugated polymer is selected from the list of polymers consisting of poly(1-methoxy-4-(2-ethylhexyloxy)-2,5-phenylenevinylene), poly(2,5-dioctyloxy-p-phenylenevinylene), poly(3,4-ethylene dioxothiophene), and poly(3-octylthiophene), and combinations thereof.
7. (original) The material of claim 3, wherein the polyaromatic hydrocarbons include naphthalene, anthracene, or rubrene.
8. (previously presented) The material of claim 3, wherein the  $\pi$ -conjugated polymers are mixed with organic polymers.

9. (original) The material of claim 8, wherein the organic polymers include polystyrene or poly(methyl methacrylate).
10. (original) The material of claim 3, wherein a metal is incorporated into the  $\pi$ -conjugated polymer structure.
11. (previously presented) The material of claim 10, wherein the metal is aluminum, gallium, boron or lithium.
12. (previously presented) A device for detecting ionizing radiation, comprising:
- electrodes, wherein said electrodes are compositionally alike;
  - a solid organic semiconducting material consisting essentially of a  $\pi$ -conjugated material having an electrical resistivity of at least  $10^9$  ohm-cm disposed between said electrodes; and
  - power supply means for providing power to said electrodes, wherein said electrodes are disposed on the surface of the solid organic semiconducting material as a single layer.
13. (original) The device of claim 12, wherein the electrodes are metals, conducting oxides, electrically conducting polymers, or combinations thereof
14. (original) The device of claim 12, wherein the  $\pi$ -conjugated material comprises a polymer.
15. (original) The device of claim 14, wherein the  $\pi$ -conjugated material includes  $\pi$ -conjugated polymers, polyaromatic hydrocarbons, or quinolates.
16. (previously presented) The device of claim 15, wherein the  $\pi$ -conjugated polymer is selected from the group of polymers consisting of polyacetylenes, polypyrroles, polyfluorines and derivatives and combinations thereof.

17. (previously presented) The device of claim 16, wherein the derivative  $\pi$ -conjugated polymer is selected from the list of polymers consisting of poly(1-methoxy-4-(2-ethylhexyloxy)-2,5-phenylenevinylene), poly(2,5-dioctyloxy-p-phenylenevinylene), poly(3,4-ethylene dioxythiophene), and poly(3-octylthiophene) and combinations thereof.
18. (original) The device of claim 15, wherein the polyaromatic hydrocarbons include naphthalene, anthracene, or rubrene.
19. (original) The device of claim 15, wherein the  $\pi$ -conjugated polymer material is mixed with organic polymers.
20. (original) The device of claim 19, wherein the organic polymers include polystyrene or poly(methyl methacrylate).
21. (canceled)
22. (original) The device of claim 15, wherein a metal is incorporated into the  $\pi$ -conjugated polymer structure.
23. (previously presented) The device of claim 22, wherein the metal is aluminum, gallium, boron or lithium and wherein lithium is in the form of a carboxylate salt and boron as boronic acid.
24. (previously presented) A device for detecting low energy neutron radiation, comprising:
- electrodes, wherein said electrodes are compositionally alike;
  - the  $\pi$ -conjugated material of claim 1 disposed between said electrodes; and
  - power supply means for providing power to said electrodes, wherein said electrodes are disposed on the surface of the solid organic semiconducting material as a single layer.

25. (original) The device of claim 24, wherein the electrodes are metals, electrically conducting oxides, electrically conducting polymers, or combinations thereof.
26. (previously presented) The device of claim 24, wherein the  $\pi$ -conjugated material includes  $\pi$ -conjugated polymers, polyaromatic hydrocarbons, or quinolates.
27. (previously presented) The device of claim 26, wherein the  $\pi$ -conjugated polymers are selected from the group of polymers consisting of polyacetylenes, polypyrroles, polyfluorines and derivatives and combinations thereof.
28. (previously presented) The device of claim 27, wherein the derivative  $\pi$ -conjugated polymer is selected from the list of polymers consisting of poly(1-methoxy-4-(2-ethylhexyloxy)-2,5-phenylenevinylene), poly(2,5-dioctyloxy-p-phenylenevinylene), poly(3,4-ethylene dioxythiophene), and poly(3-octylthiophene), and combinations thereof.
29. (original) The device of claim 26, wherein the polyaromatic hydrocarbons include naphthalene, anthracene, or rubrene.
30. (original) The device of claim 26, wherein the  $\pi$ -conjugated polymer is mixed with organic polymers.
31. (original) The device of claim 30, wherein the organic polymers include polystyrene or poly(methyl methacrylate).
32. (canceled)
33. (previously presented) The device of claim 26, wherein a metal is incorporated onto the  $\pi$ -conjugated polymer structure.
34. (previously presented) The device of claim 33, wherein the metal is aluminum, gallium, boron or lithium and wherein lithium is in the form of a carboxylate salt and boron as boronic acid.

35. (previously presented) A device for detecting ionizing radiation, comprising: an array of wires embedded in the material of claim 1, the array comprising a first set of parallel spaced apart wires intersecting orthogonally with a second set of parallel spaced apart wires; and means for supplying power to the array.

36. (previously presented) The device of claim 35, wherein the wires are spaced at a distance of from 10 $\mu$ m to 100 $\mu$ m apart.

37. (previously presented) A device for detecting ionizing radiation, comprising: a plurality of layers joined together to form a multilayer stack, wherein each layer comprises an array of wires embedded in the material of claim 1, the array comprising a first set of parallel wires intersecting orthogonally with a second set of parallel wires; and means for supplying power to each array.

38. (previously presented) The device of claim 37, wherein the wires are spaced at a distance of from 10 $\mu$ m to 100 $\mu$ m apart.

39. (previously presented) A device for measuring radiation dose to human tissue, comprising: electrodes; a  $\pi$ -conjugated polymer having an electrical resistivity of at least 10<sup>9</sup> ohm-cm disposed between said electrodes, wherein said  $\pi$ -conjugated polymer has C:H ratio and density substantially equal to that of human skin; and means for providing power to said electrodes, wherein said electrodes are disposed on the surface of the  $\pi$ -conjugated polymer as a single layer.

40. (previously presented) A device for detecting ionizing radiation, comprising:

a pair of electrodes, each having a length and width, wherein the length is greater than the width;

a solid organic semiconducting material consisting essentially of a  $\pi$ -conjugated material having an electrical resistivity of at least 10<sup>9</sup>

ohm-cm disposed between said electrodes, wherein the combination of electrodes and  $\pi$ -conjugated polymer is rolled up along their length to form a generally cylindrical-shape structure; and

means for providing power to said electrodes.

41. (previously presented) A method for detecting fission neutrons, comprising the steps of:

providing a device comprising a  $\pi$ -conjugated material having an electrical resistivity of at least  $10^9$  ohm-cm disposed between a pair of compositionally alike electrodes;

applying power to the electrodes to produce an electric field within the  $\pi$ -conjugated polymer; and

exposing the device to neutron radiation.

42. (previously presented) A method for detecting ionizing radiation, comprising:

providing a device comprising a  $\pi$ -conjugated polymer having an electrical resistivity of at least  $10^9$  ohm-cm disposed between a pair of compositionally alike electrodes;

applying power to the electrodes to produce an electric field within the  $\pi$ -conjugated polymer; and

exposing the device to ionizing radiation.

43-46 (canceled)

47. (currently amended) The material of claim 3, ~~applied to~~ as in any one of claims 1, 12, 24, 35, 37 and 40 wherein an external stress is applied by stretching the  $\pi$ -conjugated material to strain and orient the polymer chains.

48. (previously presented) The material of claim 47, wherein the external stress is applied at a temperature above the glass transition temperature of the material and below the melting temperature.

49. (canceled)